CLAIMS

What is claimed is:

1. An automated flinch-detection apparatus for measuring spatial displacement of an animal's paw injected with irritant, comprising:

an electromagnetic detecting assembly having

a transmitting occilator for generating electrical current;

an electromagnetic transmitter coil coupled to the occilator for generating an electromagnetic field;

an electromagnetic receiving coil placed in a linear plane directly below the transmitter coil;

a first, receiving amplifier connected to the receiving coil;

an amplitude detector connected to the receiving amplifier;

a second amplifier connected to the amplitude detector;

a metal object attached to the animal's paw; and

a cylindrical observation chamber of a diameter not greater than the diameter of the generated magnetic field, said chamber placed directly over the receiving/transmitting coil assembly,

wherein the current generated by the transmitting occilator circulates in the transmitter coil, creating an electromagnetic field that penetrates the metal object, creating eddy currents perturbing the electromagnetic field, said fluctuating perturbations being picked up by the receiving coil, amplified by the receiving amplifier, detected by the amplitude detector and further amplified, filtered and digitized.

2. The apparatus according to claim 1, wherein the current passing through the

transmitter coil generates an electromagnetic field in the 6 to 8 kilohertz range with a signal strength on the order of 5 to 8 milliwatts.

3. The apparatus according to claim 1, wherein the metal object to the animal's paw is a small metal annular collar.

4. The apparatus according to claim 1, wherein the metal object to the animal's paw is a small metal "C" collar in incomplete annular form.

5. The apparatus according to claim 1, wherein the metal object comprises a ferrous metal.

6. The apparatus according to claim 1, wherein the metal object comprises a non-ferrous metal.

7. The apparatus according to claim 1, wherein the observation chamber is a transparent cylindrical container, insuring that the animal will remain inside the boundaries of the electromagnetic field generated by the coil assembly.

8. The apparatus according to claim 1, wherein the observation chamber has individual compartments permitting testing of a plurality of animals.

9. The apparatus according to claim 1, wherein the detection assembly below the observation chamber has multiple independent detection units.

10. The apparatus according to claim 1, wherein the observation chamber is constructed of any rigid transparent plastic.

11. A method for measuring a flinch response by an animal whose paw has been subjected to an irritant, comprising:

attaching a metal object to the animal's paw;

placing the animal in an observation chamber situated directly over a detection assembly having

a transmitting occilator for generating electrical current,

an electromagnetic transmitter coil coupled to the occilator for generating an electromagnetic field;

an electromagnetic receiving coil that receives the generated electrical current;

a receiving amplifier that amplifies the received generated electrical current;

an amplitude detector; and

an amplifier for amplifying the amplitude detected,

wherein the current generated by the transmitting occilator circulates in the transmitter coil, creating an electromagnetic field that penetrates the metal object attached to the animal's paw, creating fluctuating eddy currents perturbing the electromagnetic field,

wherein said fluctuating perturbations are picked up by the receiving coil, amplified by the receiving amplifier, and detected by the amplitude detector, and wherein said pertubations are further amplified, filtered and digitized to produce a measured response to the irritant.

12. A method for measuring a flinch response to pain by an animal whose paw has been subjected to an irritant, comprising:

attaching a metal object to the animal's paw;

placing the animal in an observation chamber situated directly over a detection assembly;

generating electrical current by a transmitting occilator;

generating an electromagnetic field by an electromagnetic transmitter coil coupled to the occilator;

receiving the generated electromagnetic field by a receiving coil;

amplifying the received generated electrical current by a receiving amplifier having,

an amplitude detector; and

an amplifier for amplifying the amplitude detected,

wherein the current generated by the transmitting occilator circulates in the transmitter coil, creating an electromagnetic field that penetrates the metal object attached to the animal's paw, creating fluctuating eddy currents perturbing the electromagnetic field,

wherein said fluctuating perturbations are picked up by the receiving coil, amplified by the receiving amplifier, and detected by the amplitude detector, and wherein said perturbations are further amplified, filtered and digitized to produce a measured response to the irritant.

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